Patent Application No.: 09/993,800

REMARKS

The Examiner has rejected claims 1–5 under 35 U.S.C § 101. The Examiner states in his Office Action that the claimed invention is inoperative since there are no unbalanced forces acting on the watercraft.

The applicant respectfully disagrees with the Examiner. The herein enclosed English translation of a French-language technical document submitted to us by the applicant mathematically supports, according to the applicant's point of view, the functioning of the watercraft of the above-mentioned invention.

Furthermore, a package has been sent to the USPTO via express postal services, and addressed to the Examiner. This package comprises: (a) a document entitled "Suitcase contents" establishing an inventory of the contents of the package (a copy of which being enclosed herein), (b) a number of separate parts which can be assembled by the Examiner to build a working prototype of the invention. This prototype, which represents a powered vehicle, is not designed to glide over water, as described in the present patent application, but is rather designed to roll on rails through the instrumentality of ball-bearing-provided wheels. It is however submitted by the applicant that since the propelling mechanism is the same on both water-supported and rail-supported embodiments, the prototype included in the package should be considered, according to the applicant, as an analogous and representative embodiment of the above-mentioned invention. The package further comprises (c) a videocassette, in NTSC format, is also provided in the package to visually guide the Examiner in the assembly of the prototype. Footage of five tests made with this prototype has also been included on this

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videocassette; and (d) a document entitled "Contents of the videocassette" also included in the package (and a copy of which being enclosed herein), provides a listing of the different sections of this videocassette.

With respect to the unexpected results issue for supporting the utility patentability of the present invention, we are submitting herewith an Affidavit signed by the applicant himself before a notary public who has also signed. In this Affidavit, it is now declared under oath by the applicant that the device as claimed can indeed be set in a forward differential displacement.

A favourable Action is solicited.

Respectfully submitted,

LESPÉRANCE & MARTINEAU

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Certification:
I, the undersigned, François Martineau, hereby certify that this paper consisting of 11 sheets including the 4 annexes, is being facsimile transmitted to the U.S. Patent Office on October 6, 2003.

François Martineau

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Definition

Symbols	Symbol definition
Δt	Time interval
E_k	Kinetic energy
E_p	Potential energy
x	Travelled distance
m	Mass
m_1	Initial mass before addition
m_2	Added mass
F_r	Resultant force
$F_{r \max}$	Maximum resultant force
F_e	Electromagnetic force
v_{0m}	Initial velocity of the mass
R	Radius
h	Height
w	Weight
g	Gravitational constant

Case No. 1

1.1 Initial assumptions

a) Δt is very short

b) masses m_2 are coupled to m_1 when $E_{p \max}$ is reached
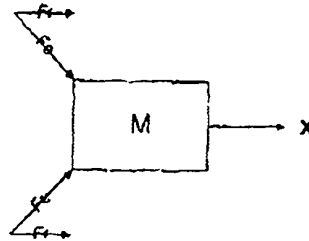
1.2 Pulse

F_e applied during Δt

Pulse $= F_e \, \Delta t$ at $45°$

Along the x-axis

$2F_r \, \Delta t = m \, v_{0m}$

$F_r = F_e \cos 45°$

$2F_e \, \Delta t \cos 45° = m \, v_{0m}$

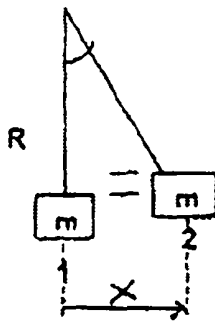$$v_{0m} = \frac{2F_e \Delta t \cos 45°}{m}$$

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1.3 Kinetic energy

$$E_k = \frac{mv_{0m}^2}{2}$$

1.4 Potential energy

$E_p = w\,g\,h$

$m = w\,g$

$E_p = m\,h$

Because of the geometry, we have that:

$h = R\,(1 - \cos\theta)$

$x = R\sin\theta$

$$\left(\frac{x}{R}\right)^2 = \sin^2\theta = 1 - \cos^2\theta$$

$$\cos\theta = \sqrt{1 - x^2/R^2}$$

$$h = R\left(1 - \sqrt{1 - x^2/R^2}\right)$$

$$E_p = mR\left(1 - \sqrt{1 - x^2/R^2}\right)$$

1.5 Principle of energy conservation

$E_k = E_p$

$E_k = \frac{1}{2}\,m\,v_{0m}^2$

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$$E_r = mR\left(1 - \sqrt{1 - x^2/R^2}\right)$$

$$\tfrac{1}{2}mv_{0m}^2 = mR\left(1 - \sqrt{1 - x^2/R^2}\right)$$

$$\tfrac{1}{2}v_{0m}^2 = R\left(1 - \sqrt{1 - x^2/R^2}\right)$$

$$\tfrac{1}{2}v_{0m}^2 = R - \sqrt{R^2\left(1 - x^2/R^2\right)}$$

$$R - \tfrac{1}{2}v_{0m}^2 = \sqrt{R^2 - x^2}$$

$$\left(R - \tfrac{1}{2}v_{0m}^2\right)^2 = R^2 - x^2$$

$$\boxed{x = \sqrt{R^2 - \left(R - \tfrac{1}{2}v_{0m}^2\right)^2}}$$

where $v_{0m} = \dfrac{2F_e\Delta t \cos 45^\circ}{m}$ or $\dfrac{\sum\left(\int F_e dt\right)\cos 45^\circ}{m}$

Case No. 2

2.1 Initial conditions

a) Two small masses m_2 mounted on a mass m_1 where $m_1 + 2 m_2 = m$ of case No. 1.
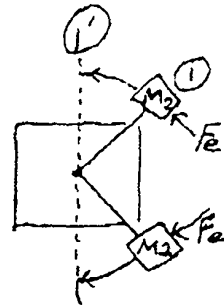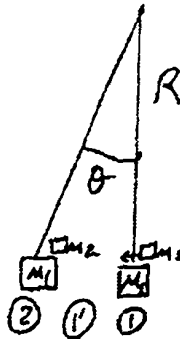
b) The momentum is constant in rotation.

2.2 Pulse

F_e applied during Δt

Pulse = $2 F_e \Delta t$

Along the x-axis

$2F_e \Delta t = 2 m_2 v_{0m2}$

$F_e \Delta t = m_2 v_{0m2}$

$v_{0m2} = \dfrac{F_e \Delta t}{m_2}$

2.3 Kinetic energy

Kinetic energy of both masses = $\dfrac{m_2 v_{0m2}}{2} \times 2$

$E_k = m_2 v_{0m2}$

2.4. Potential energy

$E_p = h\, m$

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$$x = \sqrt{R^2 - \left(R - \frac{v_{0m_{min}}}{2}\right)^2}$$

where $v_{0m_{min}} = \frac{2F_c \Delta t}{m}$

$$v_{0m_{min}} = \frac{2 v_{0m_2} m_2}{m}$$

Comparison between case No. 1 and case No. 2

Following the pulse, the displacement along the x-axis

Case 1
$2 F_c \Delta t \cos 45^\circ = m\, v_{0m}$

Case 2
$2 F_c \Delta t = 2 m_2\, v_{0m2}$

$$\Rightarrow 2m_2 v_{0m2} = \frac{m v_{0m}}{\cos 45^\circ} = 1.41 m v_{0m} \rightarrow 41\% \text{ more momentum.}$$

technical_document.doc

SUITCASE CONTENTS

Some parts contained in the suitcase have been labelled and numbered, in order to facilitate the assembly of the prototype.

Item 1) A box #1 comprising:
  a. a cart having two magnet-provided pivoting arms, which weighs 131.5 grams;
  b. a cart having two electromagnets, which also weighs 131.5 grams;
  c. a load-carrying cart.

Item 2) A box #2 comprising:
  a. a 110VAC → 9VDC adapter;
  b. a 60" electric cable;
  c. two plastic plates;
  d. a level;
  e. a screwdriver set;
  f. 4 light weights, and 1 heavy weight.

Item 3) A pink cardboard envelope #3 comprising:
  a. a small bag having replacement elastics #3a;
  b. another envelope #3b therein containing very fine replacement electric cables.

Item 4) An electric control box #4.

Item 5) A vertical pole #5 to hold the thin electric cables.

Item 6) A base #6 of the system.

Item 7) A videocassette, in NTSC format, comprising footage explaining how to assemble the prototype, and showing five tests made with the device.

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CONTENTS OF THE VIDEOCASSETTE

Start	End	Description
0 min	1 min	The suitcase is unpacked.
2 min	2 min 34s	Pole #5 is installed on base #6.
2 min 50s	3 min 30s	Box #1, containing the three (3) carts, is emptied.
3 min 40s	4 min 20s	Box #2, which contains a screwdriver set, fine electric cables, a control box #4, a level and weights, is emptied.
4 min 50s	5 min 20s	A lid is mounted over control box #4.
6 min 20s	7 min 25s	The several elastics are installed on the device.
7 min 36s	7 min 46s	Plastic plates are installed beneath base #6.
8 min 04s	8 min 42s	The three carts are mounted onto the rails of base #6.
8 min 50s	9 min 07s	Five (5) weights are unpacked from their plastic bag.
9 min 20s	10 min 40s	Fine electric cables are installed from control box #4, over to pole #5, and down to the electromagnet-provided cart.
11 min 10s	11 min 37s	Base #6 is levelled. First test: using the stops installed on the cart, the magnet-provided pivoting arms are immobilized, and a trigger on control box #4 is activated to power the electromagnet-provided cart. No differential displacement of the cart assembly is observed.
11 min 40s	11 min 45s	The stops are moved away from the pivoting arms, thus allowing the magnet-provided arms to pivot.
11 min 50s	12 min 00s	Second test: Control box #4 is activated to power the electromagnet-provided cart. A non-zero differential displacement of the device is observed.
12 min 04s	12 min 30s	Third test: Weighs are placed on each cart, and the stops are positioned to prevent the pivoting of the magnet-provided arms. Control box #4 is then activated to power the electromagnet-provided cart. No differential displacement of the cart assembly is observed.
12 min 45s	12 min 57s	Fourth test: The stops are moved away from the pivoting arms, thus allowing the magnet-provided arms to pivot, and control box #4 is activated to power the electromagnet-provided cart. A positive differential displacement of the device is observed.
13 min 10s	14 min 00s	The load-carrying cart is attached behind and towed by the electromagnet-provided cart.
14 min 10s	14 min 50s	Fifth and last test: The elastic link between the arm-provided cart and the electromagnet-provided cart is undone. This test shows the unequal displacement of the two carts, which have an identical mass of 131.5 grams.